

Plant Identification Primer



Plant Identification Primer

Workshop Goals:

- Provide an understanding of the plant ID process
- Introduce tools, resources and basic concepts for plant identification
- Provide an overview of common species and methods to aid their identification

Plant Identification Primer

Plant ID Process



Plant Identification Process

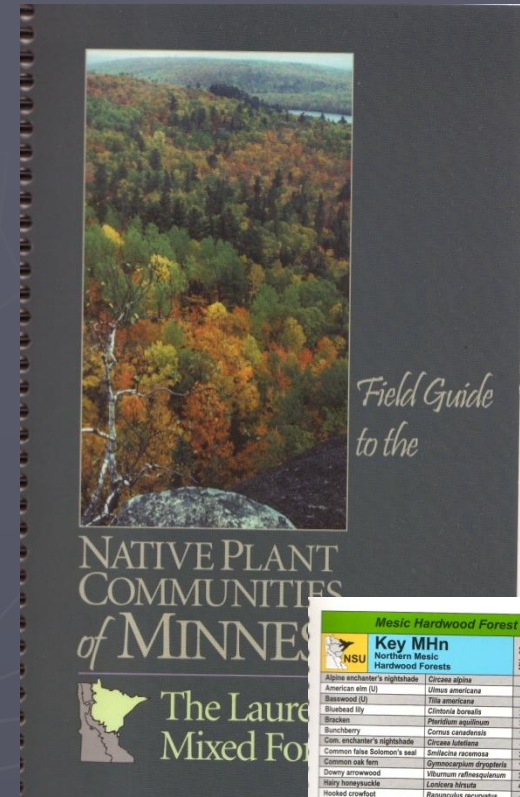
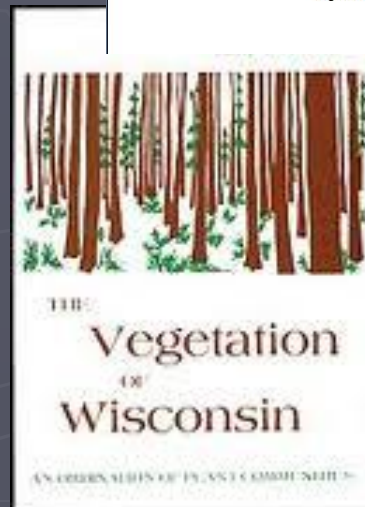
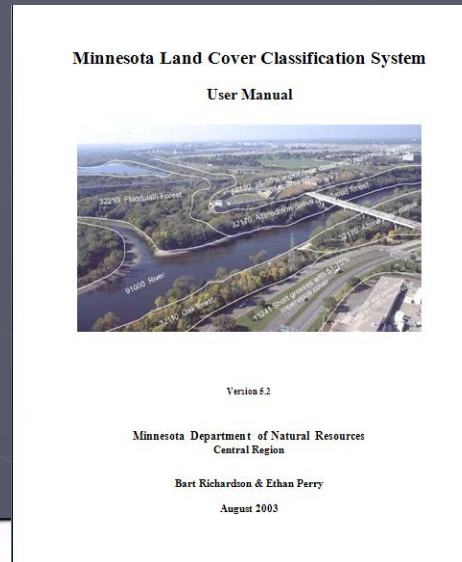
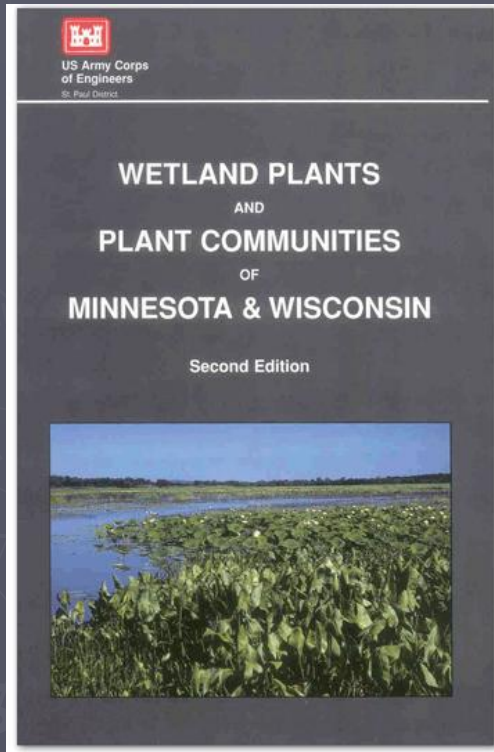
- 1) Observing the Landscape
- 2) Observing Plant Characteristics
- 3) Narrowing to Groups (Family and Genus)
- 4) Using Guides, Websites and Keys to Identify Species

Plant ID Process

1) Observing the Landscape



Landscape/Plant Community Classifications



Mesic Hardwood Forest System					
Key MHN					
Northern Mesic Hardwood Forests					
	MHN3	MHN4	MHN5	MHN6	MHN7
Alpine anemone's nightshade	-	3	3	2	2
American elm (U)	1	2	0	3	4
Basswood (U)	3	3	-	1	2
Blueberry (U)	2	2	3	2	1
Bracken	3	1	1	6	2
Bunchberry	1	-	1	6	2
Giant stickleweed's nightshade	3	3	0	-	7
Common false Solomon's seal	3	3	2	-	2
Common oak fern	1	3	3	1	2
Downy arrowweed	3	-	-	4	3
Hammond (U)	4	-	-	6	2
Hairy honeysuckle	1	1	0	1	8
Hooded crowfoot	4	4	-	-	2
Jack-in-the-pulpit	4	1	1	4	-
Lowbush blueberry	4	0	0	6	-
Mountain ash (U)	1	1	7	1	-
Shaded milkweed	1	1	1	-	3
Swampy blueberry	1	1	-	4	3
Northern red oak (U)	4	2	-	1	3
Pale bellwort	3	2	-	2	3
Parrot blueberry	6	-	8	1	1
Paper birch (U)	3	-	1	4	2
Red raspberry	1	1	2	3	3
Rugelose and yellow violets	2	3	2	1	2
Shaded elder	1	2	3	2	2
Shaded and wood ferns	1	2	3	2	2
Shaded blueberry	1	1	7	1	-
White pine	4	-	0	5	1
White hawberry	1	4	5	-	0
White spruce (U)	1	2	4	2	1
Young pines	3	3	6	1	3
Sum of Scores					
Go to appropriate Native Plant Community Class fact sheet:					
MHN3	Northern Mesic Hardwood Forest				page 136
MHN4	Northern Rich Mesic Hardwood Forest				page 147
MHN5	Northern Mesic Hardwood (Cedar) Forest				page 142
MHN6	Northern Wet-Mesic Boreal Hardwood-Conifer Forest				page 139
MHN7	Northern Wet-Mesic Hardwood Forest				page 144

* Mountain ash (Sorbus decora, S. americana), Rugelose and yellow violets (Viola canadensis, V. julianae), Shaded and wood ferns (Dryopteris carthusiana, D. intermedia)

Common Plant Community Types

Dry Oak Forest



Oak Savanna



Common Plant Community Types

Mesic Conifer Forest



Mesic Prairie



Common Plant Community Types

Floodplain Forest



Maple Basswood Forest



Common Plant Community Types

Lowland Hardwood Forest



Mesic Oak Forest



Common Plant Community Types

Wet Meadow



Wet Prairie



Common Plant Community Types

Coniferous Bog



Shrub-carrs



Common Plant Community Types

Calcareous Fen



Open Bog

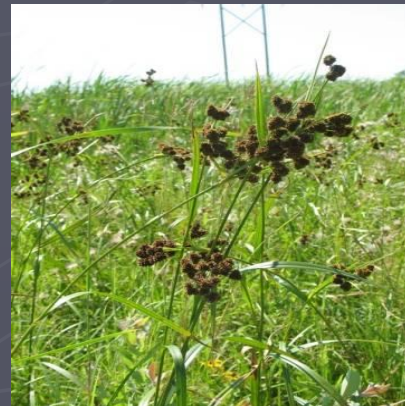


Common Plant Community Types

Shallow Marsh



Sedge Meadow



There are Many Disturbed Community Types



2)Observing Plant Characteristics

Many plant features to observe:

- Flowers
- Underground root and stem structures
- Structures associated with twigs
- Features of simple and compound leaves
- Leaf arrangements
- Attachments of leaves to stems
- Leaf venation
- Shapes of leaf blades
- Leaf blade apices
- Leaf blade bases
- Leaf blade margins
- Surface features of stems and leaves
- Modified plant parts
- Fruits and seeds

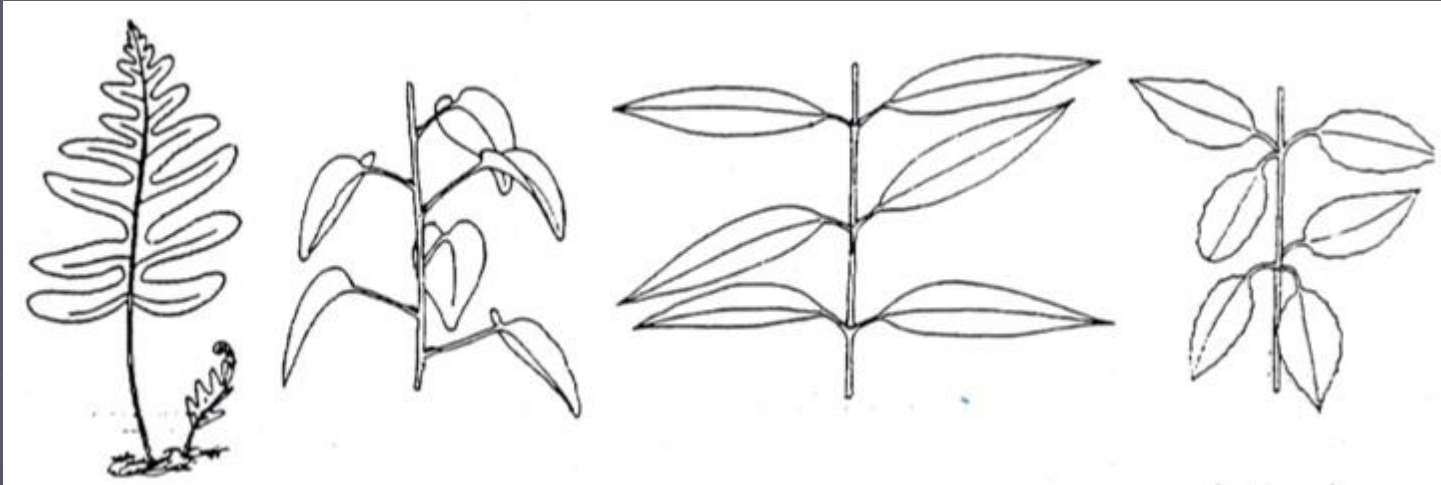


2) Observing Plant Characteristics

Other sense can be used, such as; feeling the texture of leaves and stems, smelling crushed leaves, and tasting leaves and fruit (with caution).



Leaf Structure



Basal

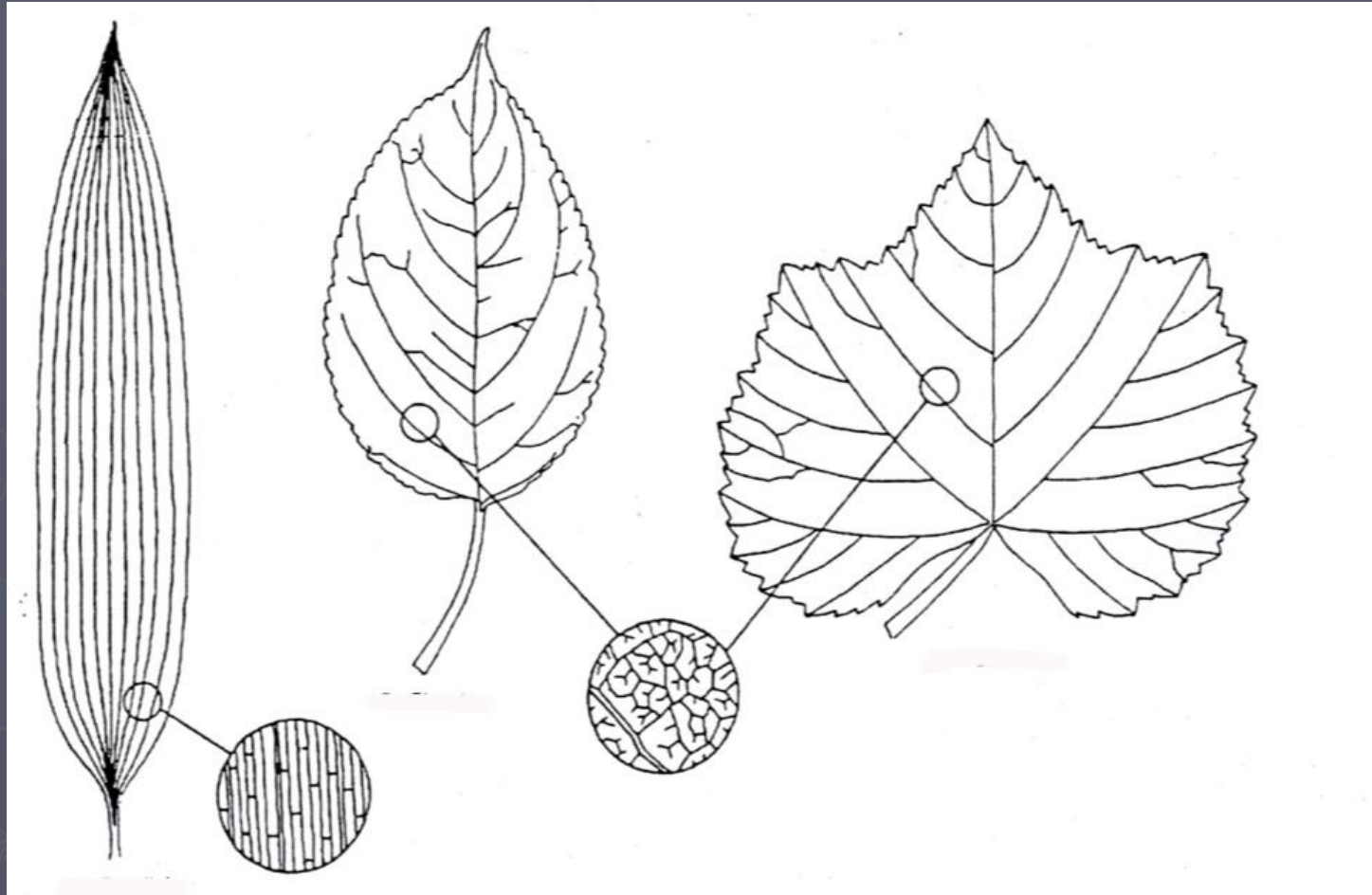
Alternate

Opposite

Whorled



Leaf Venation

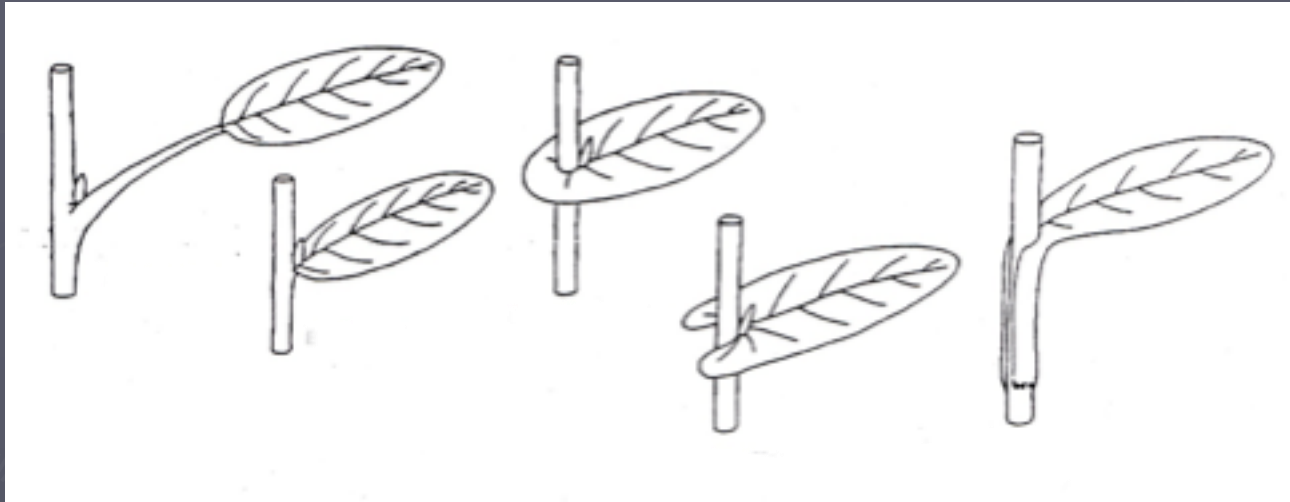


Parallel

Pinnate

Palmate

Attachment of Leaves to Stems



Petiolate

Sessile

Perfoliate

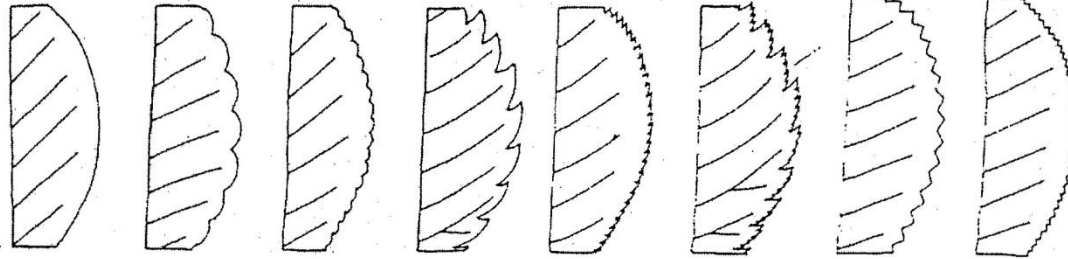
Clasping

Sheathing

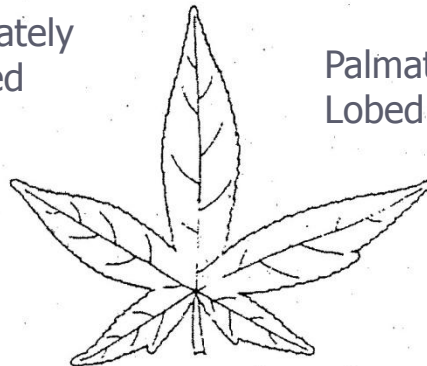


Leaf Edges

LEAF MARGINS



Pinnately
Lobed



Palmately
Lobed



Leaf Margins:

Glossy buckthorn

[*Frangula alnus*] FAC+



<http://www.uvm.edu/~alarosa/nr260/images/alderbuckthorn1.jpg>

- Non-native shrub
- Wavy leaf margins lack teeth
- Glossy leaves
- No thorns at the end of branches



Robert H. Mohlenbrock @ USDA-NRCS PLANTS Database / USDA SCS. 1989

Common Buckthorn

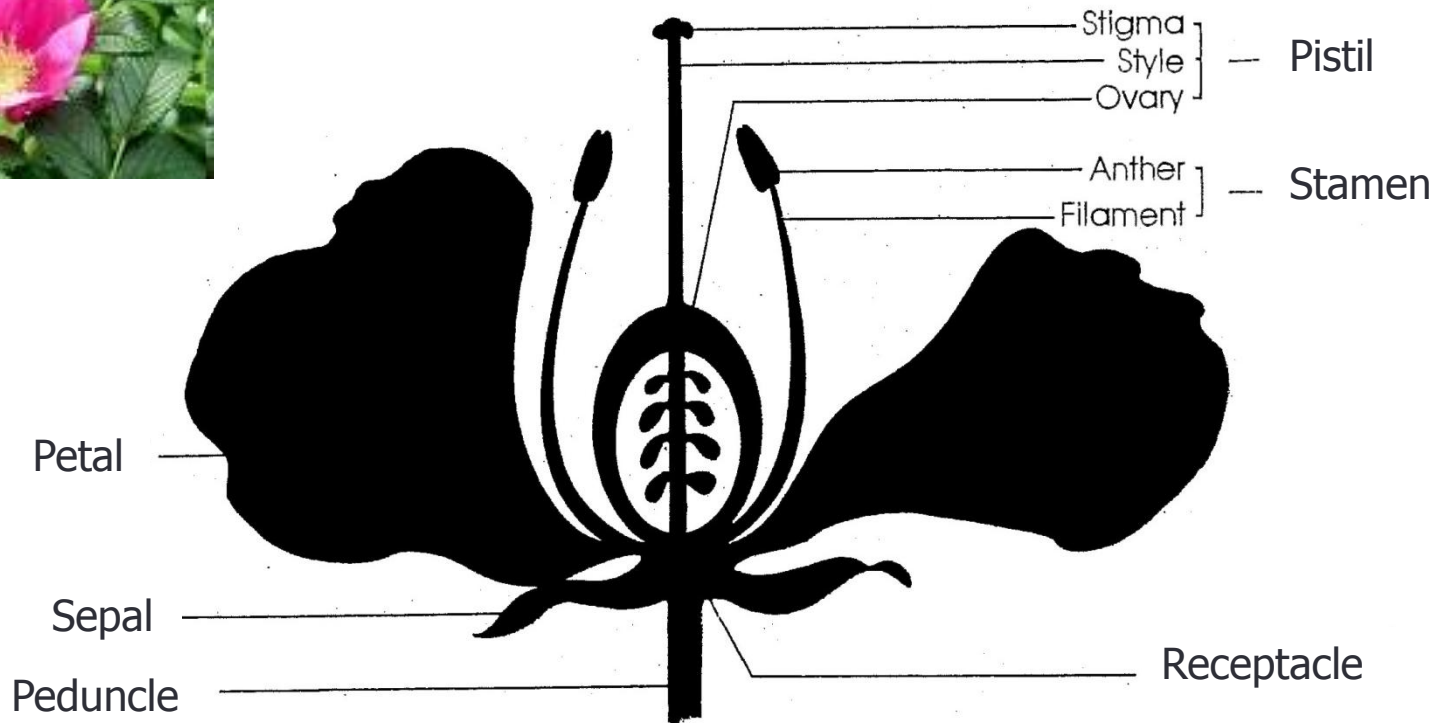
[*Rhamnus cathartica*] FACU



- Invasive shrub
- Toothed leaf margins
- Leaf veins curve up toward leaf tip
- Stem ends in a thorn



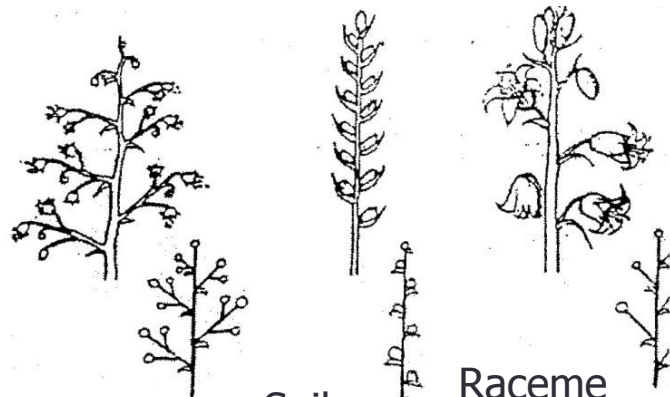
Flower Anatomy



Inflorescence Structure

Terms Related to Inflorescence

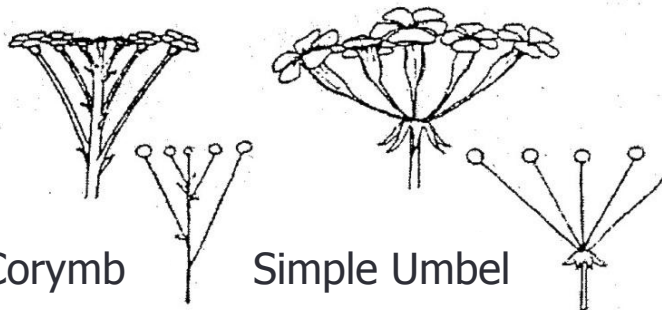
Inflorescence – The flowering part of a plant



Panicle

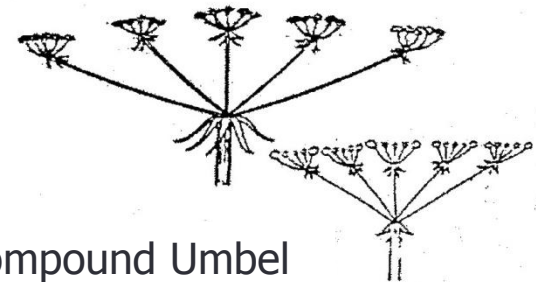
Spike

Raceme

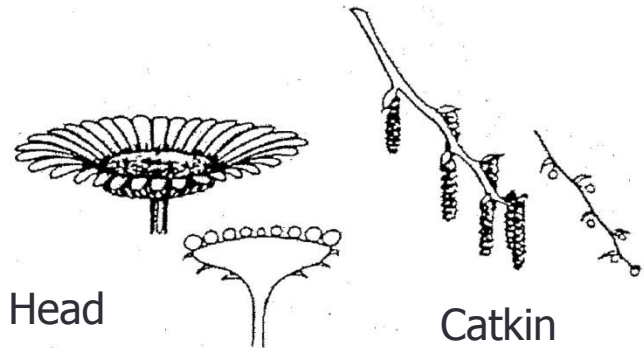


Corymb

Simple Umbel



Compound Umbel



Head

Catkin



Fruits and Seeds

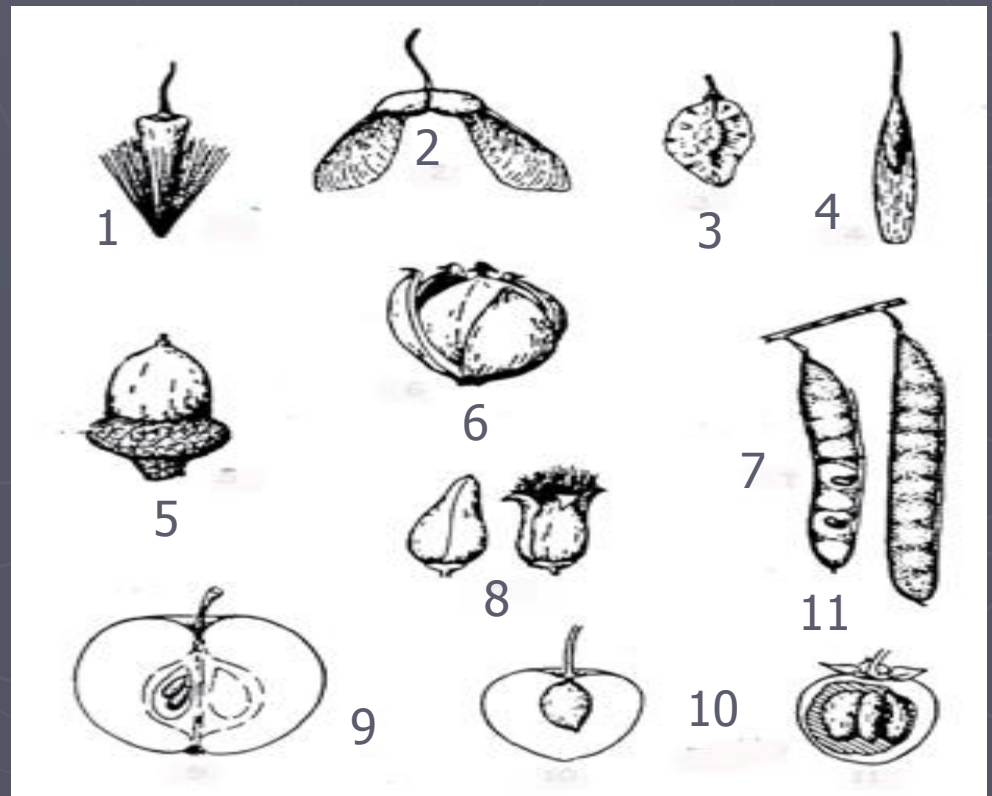
Fruit- The fruit is their ripened ovary and any other structure that is closely associated with it.

Seed- The seed is the matured ovule, containing the small plant (embryo) with a food supply to initiate its development

Separate fruit and twig keys may be used to identify plants.

Some Angiosperm Fruits

1. Achene of sycamore.
2. Double samara of maple.
3. Single samara of elm.
4. Single samara of ash
5. Acorn of oak.
6. Nut of hickory.
7. Legume of black locust.
8. Capsule of poplar.
9. Pome of apple.
10. Drupe of cherry.
11. Berry of persimmon.



3) Narrowing to Groups (Family and Genus)

- ▶ **FAMILY:** Poaceae (Grass Family)
- ▶ **GENUS:** *Calamagrostis*
- ▶ **SPECIES:** *canadensis*



Calamagrostis canadensis



3) Narrowing to Groups (Family and Genus)

Plant Families are grouped based on similar characteristics (often starting with flower structure):

Examples:

- Mints have tubular flowers and square stems
- Smartweeds have swollen joints and five petal-like sepals
- Water plantains have three white petals and large oval or arrowhead shaped leaves



3) Narrowing to Groups (Family and Genus)

There are around **160 families** of flowering plants , this includes grasses, sedges and rushes (graminoids) and around 16 families of woody plants

Non-flowering plants include around **12 families** of ferns, fern allies, and conifers

3) Narrowing to Groups (Family and Genus)

Plant Genera are grouped based on similar characteristics within a family:

Genus within the Water Plantain Family:



Alisma – Flowers on a widely branching cluster; leaves elliptical or egg-shaped

Echinodorus - Flowers in open umbels; leafless stems, leaves oval to lance-shaped, fruit a spiny burr

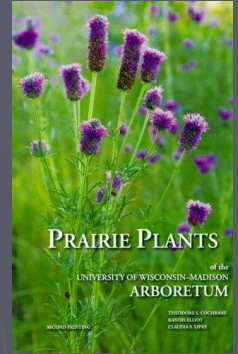


Sagittaria – Flowers in whorl of usually 3 from unbranched stalk, leaves linear or arrow shaped

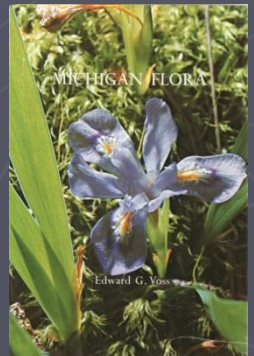


4) Using Guides, Websites and Keys to Identify Species

Field Guides – Images are used to aid Identification, generally provide a lower degree of certainty but can help group species to plant family



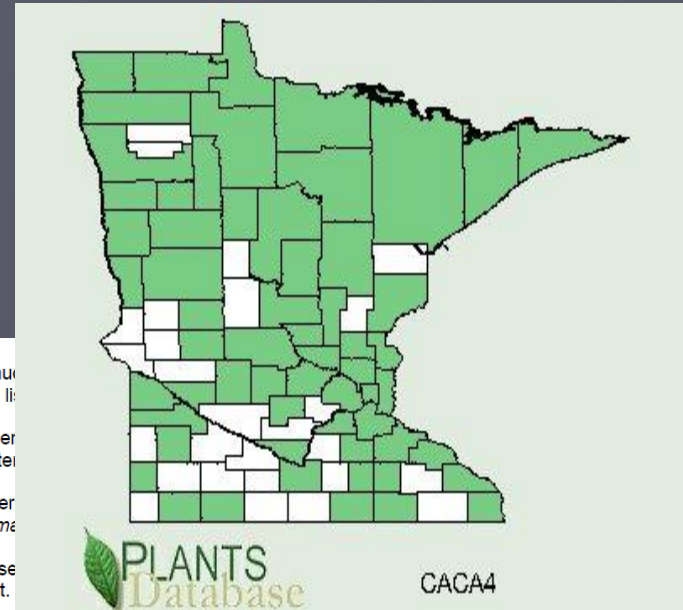
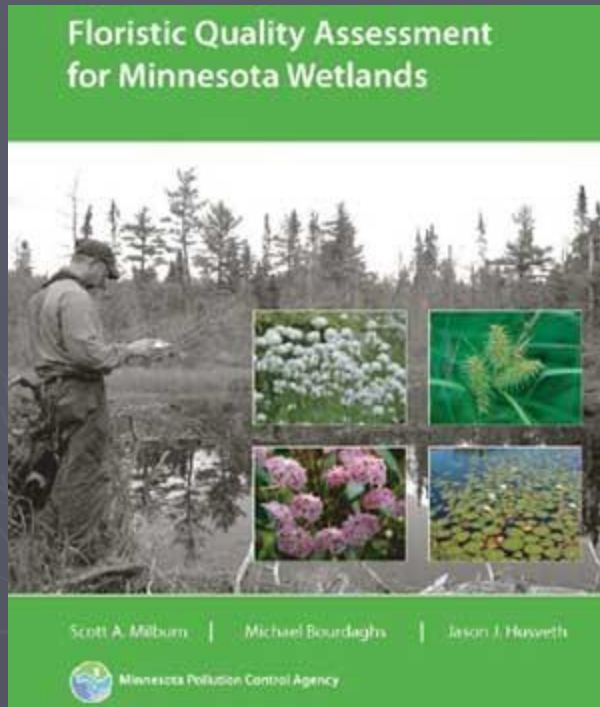
Websites – Wide variety of plant websites, most are used similar to field guides



Keys – Used for advanced identification
And for a high degree of certainty

4) Using Guides, Websites and Keys to Identify Species

Range Information/Maps/Atlases



Pteridophytes

Family classification is still undergoing much revision.
Thus species (fide FNA 1993, vol. 2) are listed as follows:

Adiantum pedatum L. / northern maidenhair
Asplenium platyneuron (L.) Britton, Steud. / state Special Concern list
Asplenium rhizophyllum L. / walking fern
Asplenium trichomanes L. var. *trichomanes* L. / state Threatened list

[*Athyrium angustum* (Willd.) C. Presl see *Athyrium filix-femina* (L.) Roth ex Mert.
northern lady fern

[*Athyrium pycnocarpon* (Spreng.) Tidestrom see *Diplazium pycnocarpon*]

[*Athyrium thelypteroides* (Michx.) Desv. see *Deparia acrostichoides*]

Azolla caroliniana Willd. / Carolina mosquito fern

reported for Minnesota by FNA but no specimens at MIN; widespread in eastern U.S. and more cold tolerant than *A. mexicana*, from which it differs in megaspore traits; unfortunately sporocarps are rarely collected but necessary for identification

Azolla mexicana C. Presl / Mexican mosquito fern

some of our specimens probably *A. caroliniana* (see comments under *Azolla caroliniana*)

Botrychium acuminatum W.H. Wagner / tailed grape fern; pointed moonwort

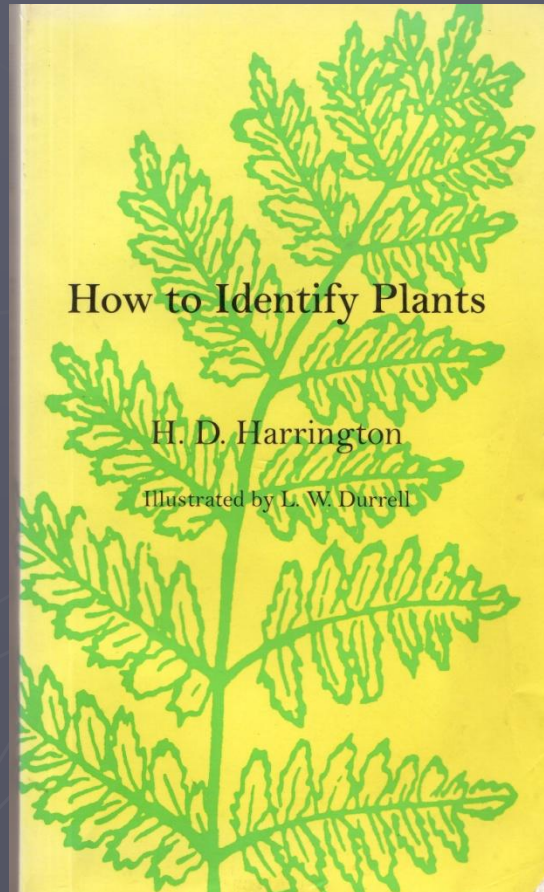
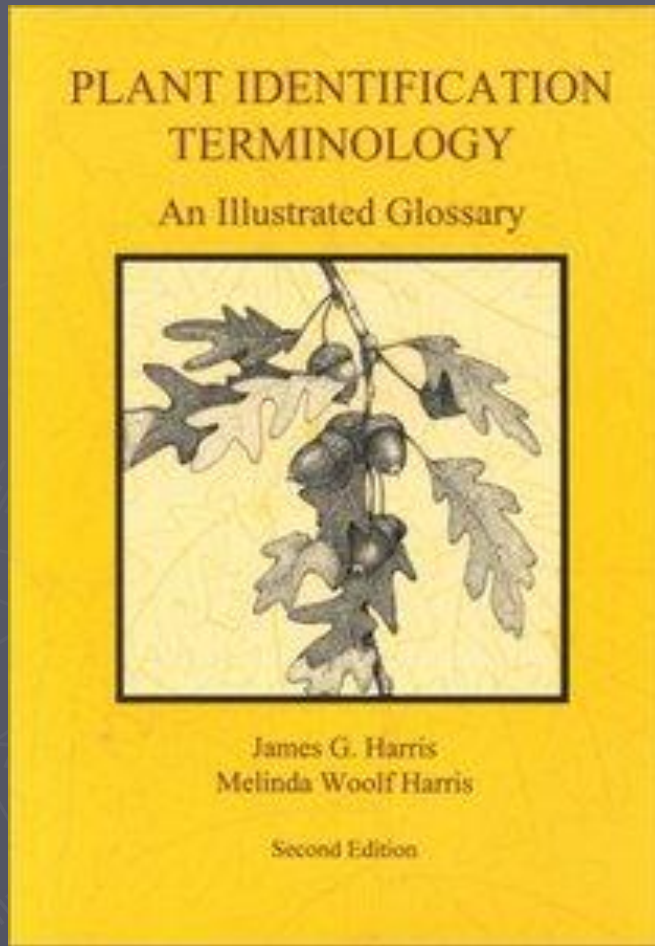
restricted to Lake Superior region; known only from Cook Co. (last collected 1999)

Botrychium ascendens W.H. Wagner / triangle-lobe moonwort; upswept moonwort
known only from mine dumps in Crow Wing Co. (and one location in St. Louis Co.); disjunct from the western montane region and Hudson Bay

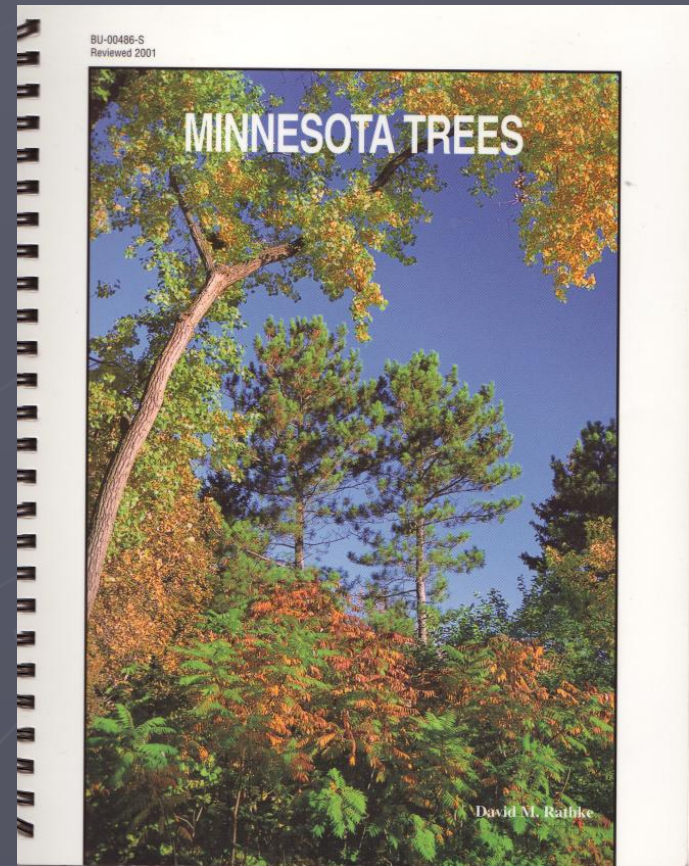
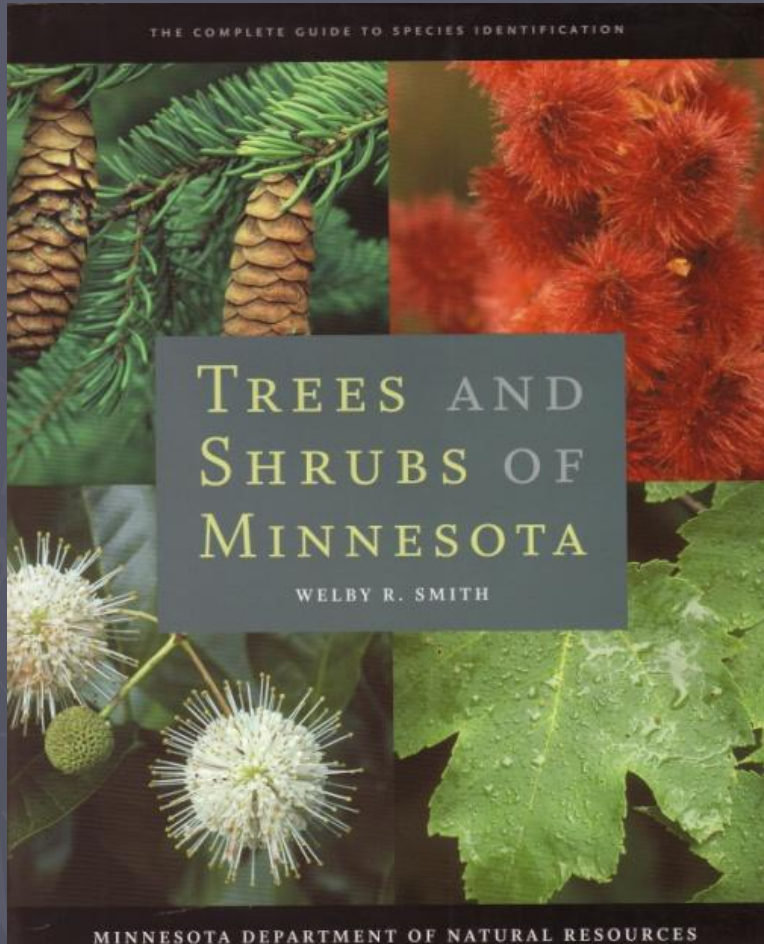
Botrychium campestre W.H. Wagner & Farrar / Iowa moonwort; prairie moonwort
state Special Concern list

Botrychium dissectum Spreng. / cut-leaf grape fern; dissected grape fern

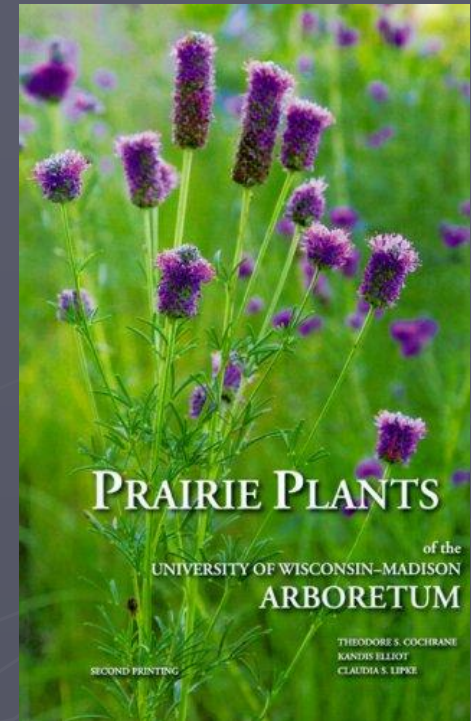
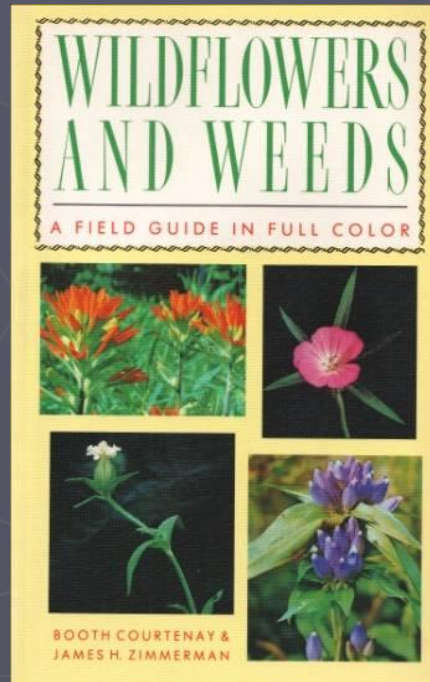
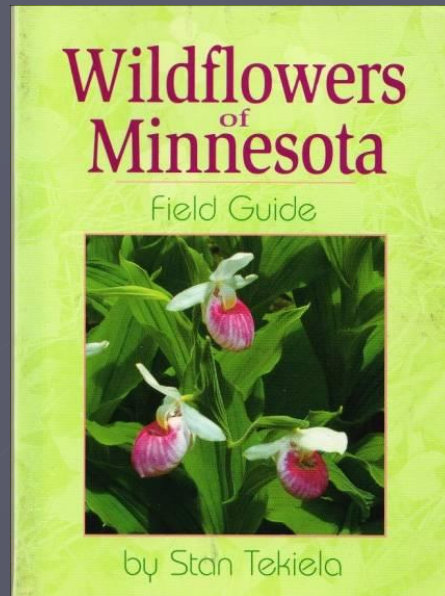
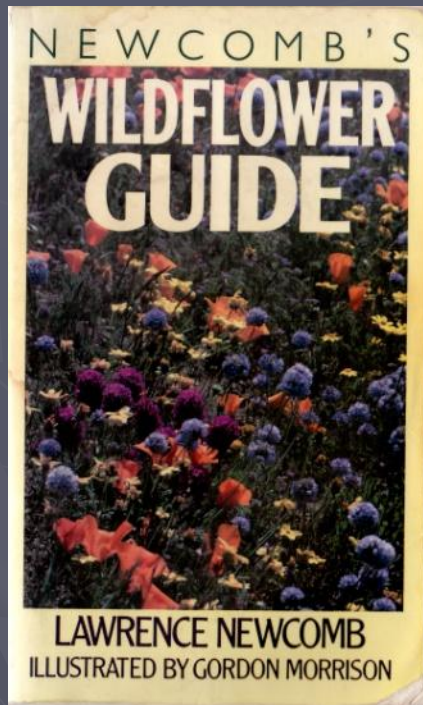
Plant Terms



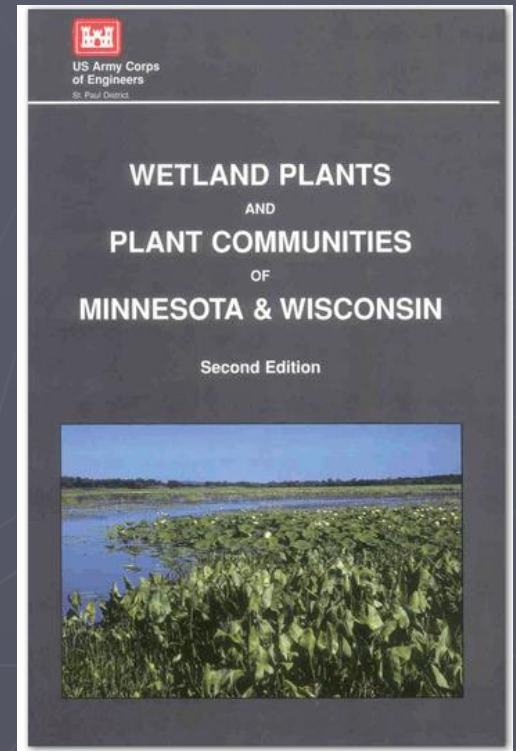
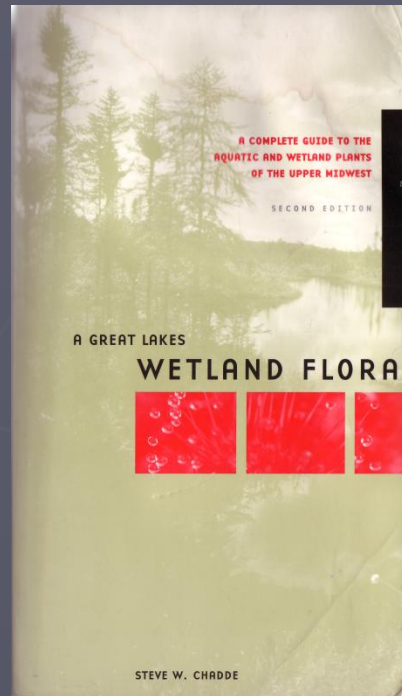
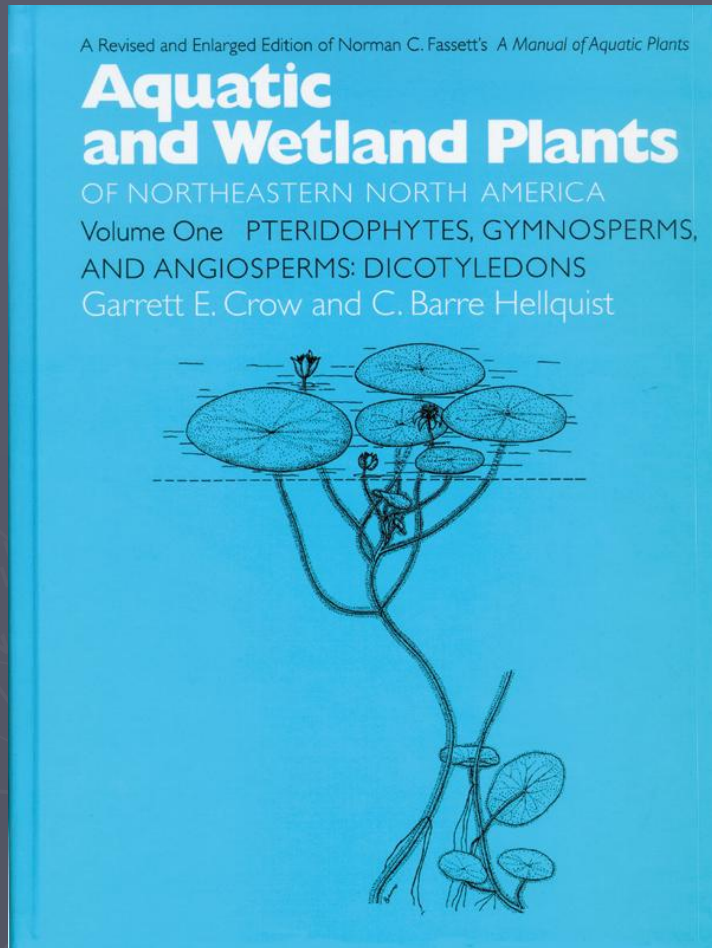
Trees and Shrubs



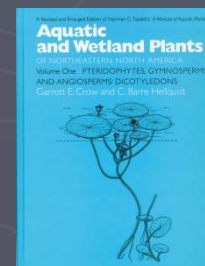
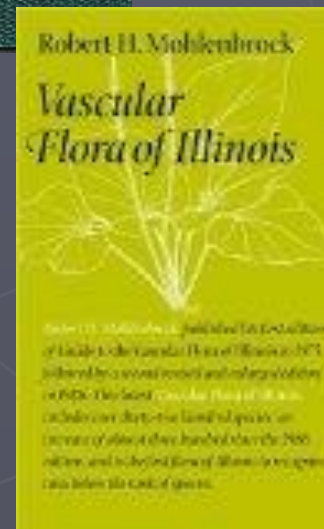
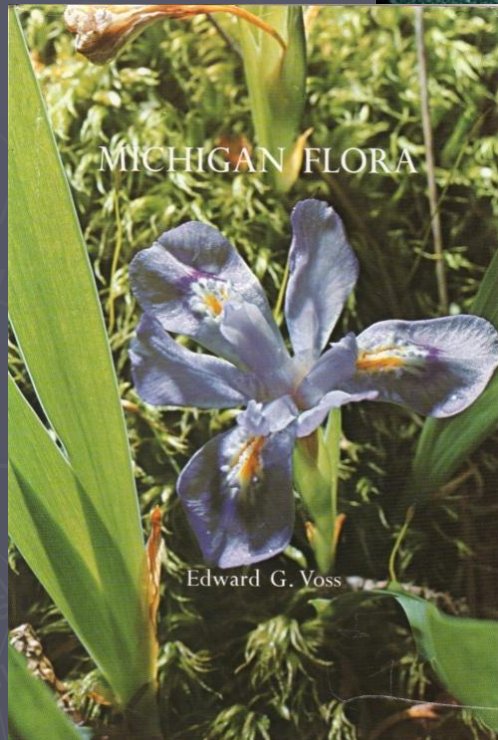
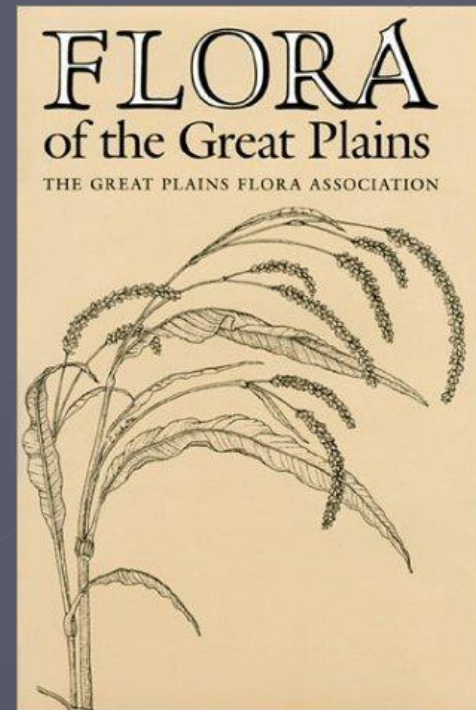
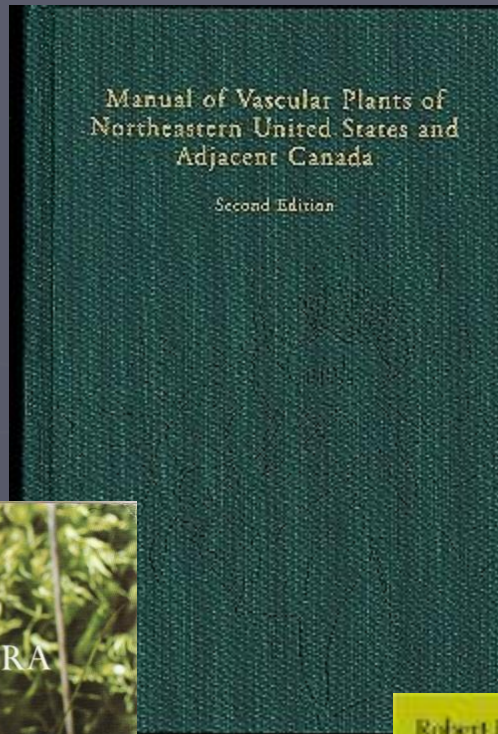
Wildflowers



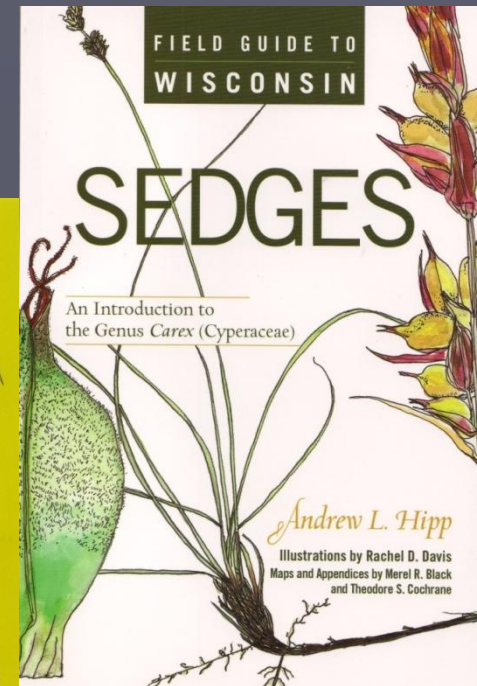
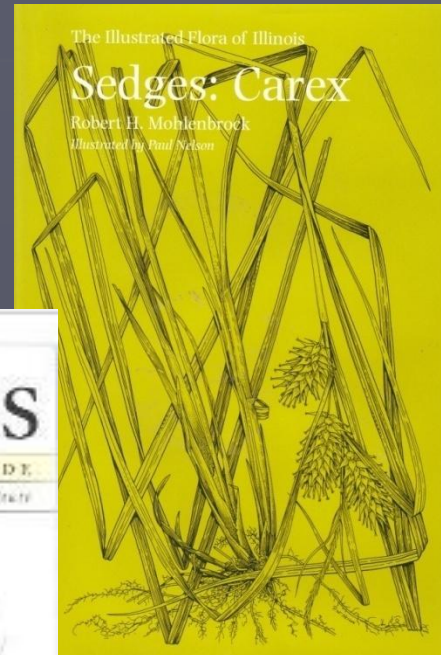
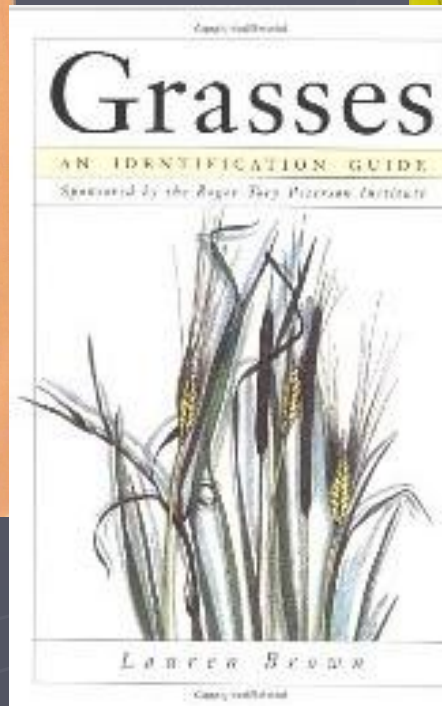
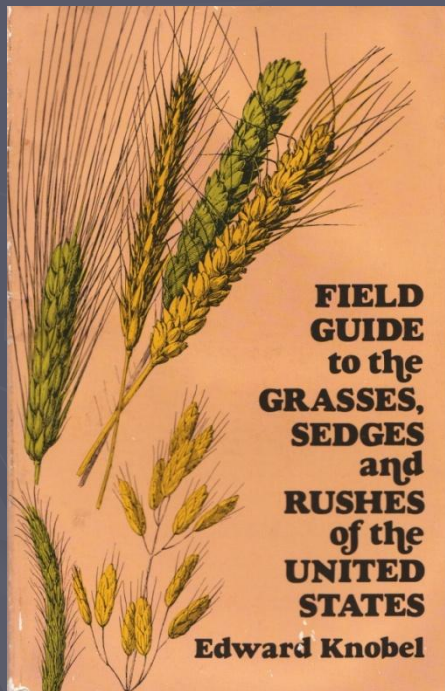
Wetland Plants



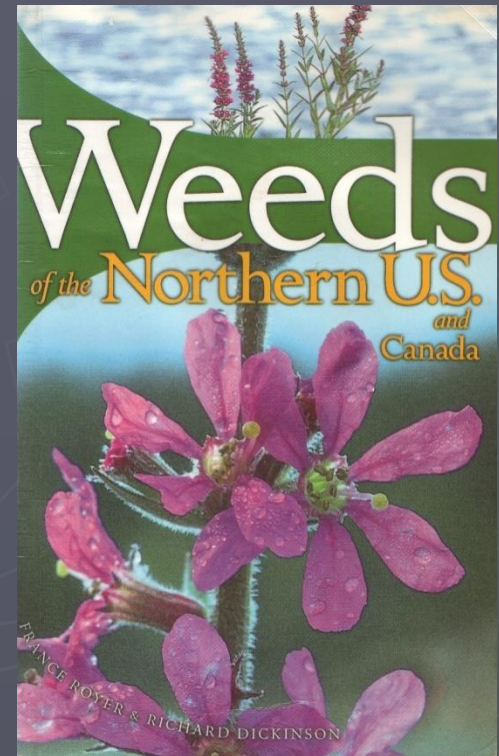
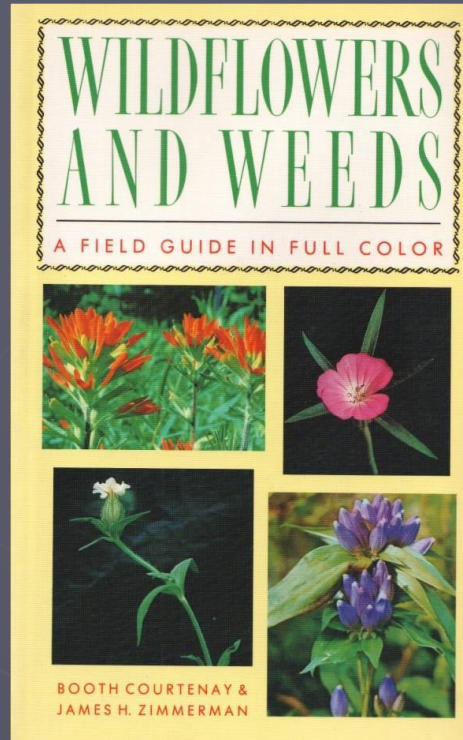
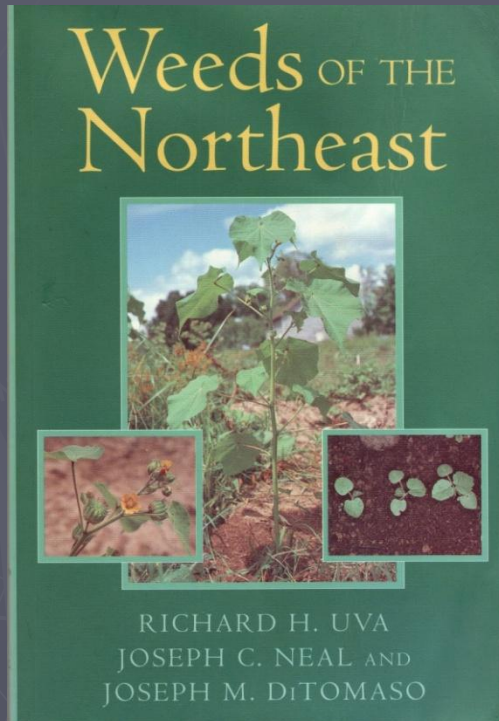
Plant Keys



Grasses, Sedges, Rushes



Weeds



Websites

<http://www.mn.nrcs.usda.gov/programs/wrp/plantid/about.html>

Minnesota Wetland Restoration Plant ID Guide

<http://www.botany.wisc.edu/wisflora/>

Wisflora: Wisconsin vascular plant families

<http://wisplants.uwsp.edu/search.html>

Robert Freckman Herbarium -UWSP

<http://plants.usda.gov/>

USDA Plants Database

http://www.bellmuseum.org/plants/general_information.htm

Bell Museum Herbarium

<http://www.dnr.state.mn.us/npc/index.html>

MDNR – Native Plant Communities

<http://dnr.wi.gov/invasives/plants.htm>

WDNR – Invasive Plants

<http://www.dnr.state.mn.us/invasives/terrestrialplants/index.html>

MDNR - Invasive Plants